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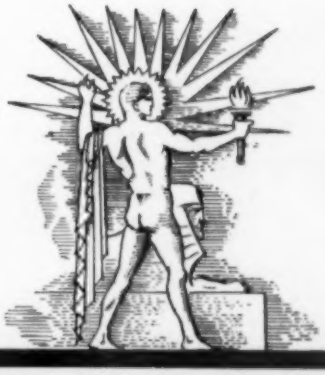
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



OCTOBER 5, 1935

The Pleistocene Looks at You

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

The Congo region of Africa has been under Belgian rule 50 years.

Young deer sometimes fight one another by boxing with their front hoofs.

Bulgaria is trying to grow pyrethrum, used in insecticides, in its effort to diversify crops.

British scientists interested in exploration of caves of Britain have formed the British Speleological Association.

About 20 per cent. of the students preparing for the medical and dental professions in Germany are now women.

The experiment of not using money was tried by the Incas of ancient Peru, the Spartans of Greece, and recently for a while by Soviet Russia.

Although the coast of Maine is only 225 miles in a straight line, the state has a shore line of 1,319 miles if its irregular outlines and islands are measured.

"Pyramidiot" is the epithet coined by a British archaeologist to fit people who persist in making Egyptian pyramids out to be mystic and symbolic, despite archaeological agreement that these pyramids are tombs and nothing else.

Cut poppies keep best if floated on lukewarm water.

Houses built of copper are being introduced in this country.

India's "untouchables" in the Hindu caste system number 50 millions.

Droughts kill more people in northern China than the spectacular floods.

The most extensive empire ever established was that of the Mongols under Kublai Khan.

Autopsies performed on zoo animals when they die sometimes shed new light on obscure forms of disease.

In the Sahara Desert wounds are said to heal with extraordinary ease, due to the relative freedom from trouble-making bacteria.

The United States is to confer with the Canadian government regarding construction of a motor highway crossing Canada to reach Alaska.

If properly cared for, a half-acre garden will produce enough vegetables for year round use by the average family, says the U. S. Department of Agriculture.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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SURGERY

Surgery Saves Patients From Heart Constriction

Removal of Part of Pericardium Saves Patients From Death or Life of Hopeless Invalidism From Pick's Disease

HITHERTO hopeless Pick's disease has yielded to the surgeon's knife, which frees the heart from the abnormal tightening grip of the surrounding fibers.

"Cure is now possible by surgery and an imposing number of successful cases of pericardial resections is being accumulated," states Dr. Paul D. White of the Massachusetts General Hospital, Boston, (*Lancet*, Sept. 14).

Patients doomed by this disease to an untimely death or at best to a life of invalidism have been saved by surgical removal of part of the fibrous bag which surrounds the heart, called the pericardium. In Pick's disease the wall of this bag thickens and becomes so contracted that it constricts the heart, preventing its normal filling in dilatation. Patients having this condition suffer from dropsy of the abdomen, legs, and face. They may be short of breath. The liver is enlarged and the jugular veins are unduly prominent.

Six Patients Cured

Dr. White reports six patients cured and one 75 per cent. relieved by surgery.

The first successful operation for the condition in America was performed by Dr. White's surgical colleague, Dr. E. D. Churchill. Dr. White has been interested in the diagnosis of the disease and in the present report points out how this condition may be distinguished from other diseases with which it is often confused, among them cirrhosis of the liver.

Dr. Churchill has been responsible for the operative treatment with the impressive cures of patients who formerly would have remained invalids for the remaining years of their lives.

Besides the record of six patients cured at his own institution, Dr. White calls attention to the fact that Dr. Claude Beck and associates of Cleveland have reported five patients cured and one improved, and Dr. Charles S. Burwell and associates of Nashville have reported three patients greatly relieved and two partially relieved by operation.

The first patient successfully treated by surgery was an eighteen-year-old girl who had suffered from Pick's disease for years. She was unable to attend school and led the life of an invalid, with frequent visits to clinic and hospital for medical treatments that gave little or no relief.

"She certainly has had a very miserable time and I am afraid there is not much that can be done to help her," Dr. White said in reporting her condition shortly before the operation.

At operation, Dr. Churchill removed an area of constricting pericardium about the size of the palm of the hand. Within a few weeks the patient had lost all her dropsy, her liver had decreased considerably in size and her weight dropped thirty pounds. She has continued in excellent health and full activity ever since, a period of nearly seven years.

"There are three essentials for a successful operation," Dr. White states in discussing the surgical cures of Pick's disease.

These are: (1) accurate diagnosis; (2) selection of a case that is more or less crippled and yet not too sick to stand the extensive operation that is necessary—what surgeons call a "reasonable risk;" and (3) an experienced chest surgeon who is "bold and yet cautious, who will do enough to free the heart and yet not too much to endanger the patient's life."

Treatment of the disease by digitalis or by another surgical operation called omentopexy should be discarded, Dr. White declared, because they are ineffective, both in theory and in practice.

Science News Letter, October 5, 1935

ASTRONOMY

No South Polar Star in Cold Antarctic Heavens

STARS that circle endlessly through the Antarctic night, when the midnight sun is shining on the earth's opposite pole, have no master-star to stand at the center of their dance.

This is shown strikingly in a photograph taken during the stay of the second Byrd Antarctic Expedition at Little America, by Prof. Thomas C. Poulter, Physicist at Iowa Wesleyan College, who was second-in-command of the expedition. The photograph in this case was made by pointing a camera at the zenith and leaving the shutter open for an hour.

NO SOUTH POLE STAR

Note that at Little America the "Pole" of the sky is not far from the zenith or center of the picture. Stars register their circling courses around the pole as concentric arcs of light.

Such a picture of the northern sky always shows the Pole Star at the center, a steady point of light, but the center of the Antarctic sky is blank—a target without a bullseye.

Science News Letter, October 5, 1935

ARCHAEOLOGY

Grave of Rich Viking Has Been Found in Sweden

THE GRAVE of a fifth century Viking chief, buried with his horse, armor, and more gold ornaments than any burial mound in Sweden has ever revealed, has been unearthed at Fullero, in Upland province.

The Viking was buried in full panoply, is the verdict of archaeologists who have examined the remnants of cloth, shield buckle, silver spur, and gold rings, from the grave. Parts of the horse's skeleton were also found. Above the grave was a fire pit of hard clay lumps for the funeral pyre.

The antiquities go, by law, to the Historical Museum at Stockholm.

Science News Letter, October 5, 1935

One of Darwin's Last Letters

Down,
Beckenham, Kent.

Railway Station
Orpington, S.E.R.

April 3rd, 1882

Dear Sir,

After much deliberation I have thought it best to send your vy interesting paper to the Zoological Soc. in hopes that it will be published in the Journal. This Journal goes to every Scientific institution in the world, and the contents are abstracted in all year-books on zoology. Therefore I have preferred it to "Nature", though the latter has a wider circulation, but is ephemeral.

I have prefaced your essay by a few general remarks to which I hope that you will not object.

Of course I do not know that the Z. Soc., which is much addicted to mere systematic work, will publish your essay. If it does I will send you copies of your essay, but these will not be ready for some months. If not published by the Socy. I will endeavour to get Nature to publish it. I am vy anxious that it should be published and preserved.

Dear Sir
Yours faithfully,

(Signed) Ch. Darwin.

ASTRONOMY

Dark Regions in Space Less Black Than Was Supposed

CELESTIAL "coal sacks," the dark areas of the sky where great clouds of cosmic dust obscure the light from stars behind them, are not quite so black as previously supposed, Director Otto Struve and Dr. C. T. Elvey of the University of Chicago's Yerkes Observatory told the American Astronomical Society.

As seen on astronomical photographic plates the dark coal sack regions appear as vacancies among the stars. Astronomers generally consider them, Dr. Struve told Science Service, as great condensations in the general cloud of inter-stellar dust which pervades all space.

Stars which shine through such dust clouds have their light reddened just as the sun at sunset looks redder because its rays pass through a greater length of terrestrial dust than when the sun is overhead.

Prior to recognition of the dust screens in space there were many errors in determining the distance of stars because of the dimming of their light, Dr. Struve pointed out.

The new investigations disclosing that the coal sack regions are not quite so dark as previously thought were made possible by a combination of instruments never before reported in the literature.

The great 40-inch diameter refracting telescope of Yerkes Observatory was coupled to a newly designed photometer constructed by Dr. Elvey. Photometers are sensitive light measuring instruments. Dr. Elvey's instrument was built from a design first suggested by the world-famous French astronomer-mathematician Prof. Ch. Fabry of Paris.

With the 40-inch lens of the telescope gathering the faint light from the coal sack regions and the photometer to give quantitative measurements of its intensity, Drs. Struve and Elvey found that the dark regions were slightly brighter than the background sky. The difference, however, is so slight as to be close to the lower limit which can possibly be detected with the precision instruments of modern science.

Many technical difficulties had to be overcome by the Yerkes observers, Dr. Struve explained. Effects which would be caused by the earth's atmosphere required that observations be made only when the dark region to be investigated was rising or setting and was almost exactly the same distance above the horizon as the polar stars, so that these stars, which always remain at the same altitude, could be used as standards or comparison stars in determining the brilliancy of the region. Probably twenty or thirty additional dark clouds will be observed during autumn.

Science News Letter, October 5, 1935

MUSIC

Plagiarism in Music Detected by Dictionary

NEW YORK'S "Tin Pan Alley" composers will find themselves in difficulty if a new musical dictionary invented in Vienna crosses the Atlantic. Thousands of old tunes and musical themes are so arranged that anybody with even a slight knowledge of music can find where, when and by whom any allegedly new tune was first composed.

Since many modern "hits" are notoriously only the bones of old masters made to jig to a jazz rhythm, this new dictionary can make life very uncomfortable to present-day tune-grinders by showing up their plagiarisms.

The dictionary is based on the simple fact that the seven tones of the scale are named for the first seven letters of the alphabet. Each theme is written on a card, as a combination of the letters of which it is made up. The first few letters suffice for "initials." Thus, the entry for The Star-Spangled Banner, as written in the key of C, would read: Gecegc.

Identification of tunes, many of them unknown to the testers, has been tried by humming them to the two inventors of the system, and in every case the original composition traced without difficulty. Thousands of tunes and themes have already been listed, and more are being constantly added.

The music dictionary is the work of two brothers, Werner Rolleder, a concert pianist, and Anton Rolleder, a judge, both of Vienna.

Science News Letter, October 5, 1935

HISTORY OF SCIENCE

Letter Written by Darwin Returned to Down House

A LETTER written by Charles Darwin, the great evolutionist, a few days before his death has been returned to Darwin's residence, Down House, now a shrine of science under the protection of the British Association for the Advancement of Science.

Written to Dr. H. T. Van Dyck, then lecturer and now emeritus professor of zoology at the American University at Beyrouth, Syria, over 53 years ago, on April 3, 1882, Darwin praises an essay by Dr. Van Dyck and says he is recommending its publication by the Zoological Society of London. Darwin died 16 days later.

Dr. Van Dyck has added the letter to the Darwin relics in Down House.

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EVOLUTION

Evolution and Diet Causing Man to Lose His Teeth

A GLOOMY future for the teeth of mankind—a future in which we shall have to pamper our mouths increasingly—is foreseen by Dr. William Seidel of the U. S. Marine Hospital in Norfolk, Va. Dr. Seidel bases his forecast on existing knowledge of the causes of various dental ills.

Evolution and diet are causing man to lose his teeth, in Dr. Seidel's opinion. Since evolution is an irreversible process, the human oral cavity appears destined to be forever afflicted with caries, pyorrhea and misplaced teeth, he says.

Loss of teeth through evolution has been going on for centuries, Dr. Seidel points out. The great length of time is indicated by the fact that we have already completely lost 16 permanent teeth, having now only 32, while the usual number for mammals is 48. Individually one can lose a good many teeth at one séance with an exodontist, but the evolutionary process is slow and it has required many centuries to produce such a change in our dentition.

This evolutionary change dates back at least to the age of the caveman, according to Dr. Seidel, and accompanying it there has been a gradual degeneracy of the whole masticatory apparatus. The teeth themselves, he says, are not anatomically degenerate, with the exception of the third molars, which are often rudimentary; and as some persons do not have third molars, the evolution in dental economy may still be in progress.

Dental caries, or decay, is the most universal and common disease of mankind and this condition, as well as that of malformed mandibles, is due to the fact that the masticatory organs of modern man have become unfitted properly to perform their functions, according to Dr. Seidel. Not only are the gums and teeth themselves insufficient, but the mandible and maxilla, together with their alveolar bone and sockets, are also deficient.

The mere fact of the high incidence of caries proves the inadaptability of the teeth to modern diet—an inadaptability that is hygenic in character rather than mechanical or physiological. Modern foods do not keep the teeth clean; and nature surely intended that they should be kept clean through natural processes rather than by modern artificial means which are found so necessary today. While cleanliness may not be the only factor in decay, it is considered to be the most important one.

In studying the cause of caries, investigators have taken two routes, those on one holding to the belief that bacteriological activity is the essential factor, while those on the other believe that the nutritional and physiological processes hold the clue, a theory supported to some degree by animal experimentation.

Aside from the nutritional aspect as a primary cause, modern diet has two very important secondary effects on the teeth: first, the decreased roughage results in failure in mechanical cleansing; and second, the increased starch and carbohydrate intake forms plaques on the teeth which make ideal growth media for bacteria. At the present time, according to Dr. Seidel, the best definition and most tenable explanation of caries is that the condition is a decalcification due to the dissolution of the calcium salts of the enamel by the acids formed by the bacteria under the plaques. As the decay reaches the dentine, further deleterious action is produced in the more abundant organic matter there. For practical purposes, therefore, one can hold fast to that old prophylactic maxim that "A clean tooth never decays."

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ENGINEERING

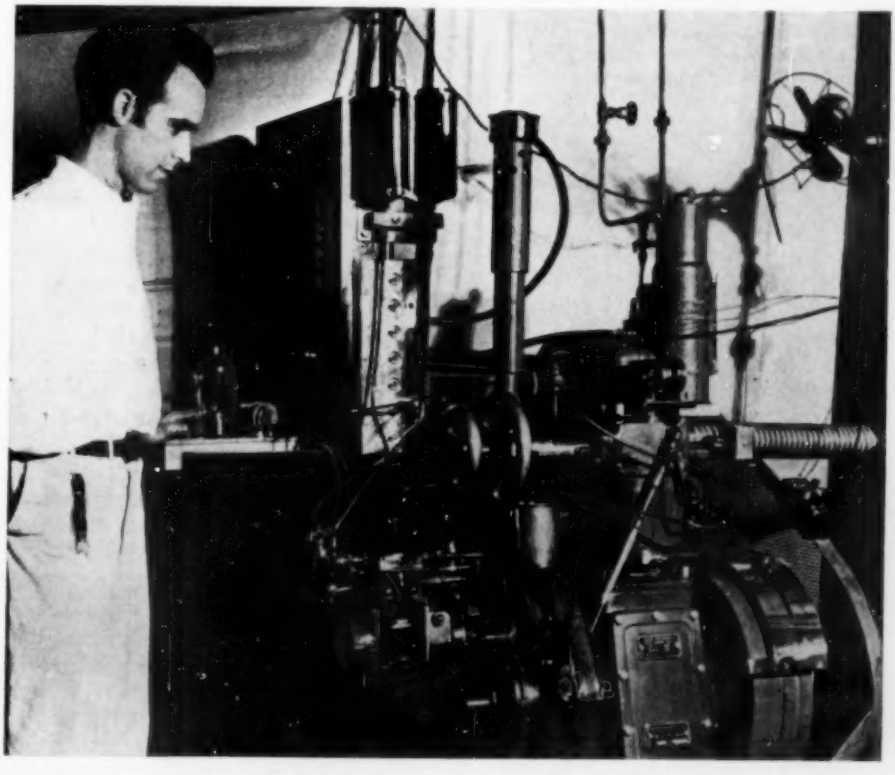
Develop Device to Test Bumpiness of Diesel Fuel

ADD to your vocabulary—cetene number!

You've heard of octane number in rating the bumpiness, or knocking power, of your gasoline. Cetene number is the same thing for the fuel oil in Diesel engines. You'll hear more of cetene number as the gasoline resources of the nation diminish and transportation turns more and more to Diesel-propelled vehicles.

Already fuel engineers of Pennsylvania State College are studying Diesel fuels and their characteristics. Looking ahead, they are preparing for a condition now nearly at hand in truck and bus transportation, and which will some day come to pleasure cars.

Prof. P. H. Schweitzer and his research associate, Theodore B. Hetzel of the School of Engineering, explain that



MEASURING CETENE NUMBER

This apparatus is used at Pennsylvania State College to measure the bumpiness, or knocking rating, of Diesel fuels. Cetene number is the Diesel fuel equivalent of the octane number for gasolines—the smoothness of performance in the engine.

LIGHTNING TWISTS

This is a snapshot taken by Phil F. Brogan, weather observer of Bend, Oregon, during a fierce 3-hour storm when he and Mrs. Brogan, aided by a stopwatch counted 41 bolts to the minute, or a probable total of 7,380 lightning flashes during the one storm. In explaining his success with "snapping" the flash, instead of leaving the shutter open to take what came, Mr. Brogan said that he might have aimed at an earlier flash and caught this one by luck.

bumpiness in Diesel fuel is caused by an almost opposite happening from that which causes the comparable knock in gasoline.

Gasoline knock—and the accompanying octane rating—comes about because the gasoline starts to burn evenly in the automobile cylinder, and then suddenly the unburned part explodes all at once with the resulting knock.

For smooth combustion with a knocking gasoline, the burning of the gas must be retarded. Tetra ethyl lead will bring about this deceleration and is widely used for the purpose.

With Diesel fuel, combustion is not set off by spark plugs—there are none—but by the spontaneous ignition due to compression of the fuel which raises its temperature above that needed to make it explode.

If too much fuel spontaneously explodes at once, there is the knock. The way to stop it is to have the fuel burn as soon after it enters the cylinder as possible; speed up combustion instead of slowing it down as is done for gasoline.

To test the comparative values of Diesel fuel, the important point is to measure the ignition lag, the time between the injection of the fuel and its ignition, and make it as small as possible.

The contribution of Prof. Schweitzer and Mr. Hetzel to Diesel fuel science is the development of an ignition lag indicator which employs the principles of a phonograph pick-up device used with a radio loudspeaker.

One pick-up is connected to the fuel injection nozzle and gives a surge of current when the fuel first enters; the other is connected to a small diaphragm on the walls of the firing cylinder and indicates when the fuel ignites.

Standard Diesel fuels and special laboratory test fuels are compared for performance over a wide range of compression values within the testing engine.

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MILITARY SCIENCE

Civilian Population Without Adequate Poison Gas Defense

GAS WARFARE against civilians is one point where the old military axiom of a strong attack providing a good defense holds true. The menace to civilization of attacks on cities by poison gas delivered from the air has all Europe worried. The inhabitants are being put through gas mask drills and defense technics, but Great Britain's best known science journal, *Nature,* states (Aug. 3), that it is generally agreed that there is no effective means of defense. Attacked countries will be obliged to retaliate in kind on the cities of the aggressor.

Against trained troops war gas does not appear to cause any more casualties than an equal number of high-explosive shells; but military training and discipline are hardly possible among the civilian population.

Arthur Marshall, veteran British chemist, writing in the journal, points out that the greatest damage to the population, both physical and moral, would probably occur if squadrons of low-flying airplanes sprayed gas over a city and then were followed by others dropping high-explosive bombs. On a day when low clouds were prevalent such an attack could be undertaken with little counter damage from anti-aircraft guns and defending airplanes.

The British Science Guild, Mr. Marshall points out, recently learned from Davidson Pratt, formerly an official of the Chemical Research Defense Department, how civilians can protect themselves in gas-proof rooms. It would be necessary to devote a properly sealed room in the upper story of a home for this purpose, just as the mid-western farmers of the United States have their storm cellars for refuge against natural instead of man-made emergencies.

To make such rooms really effective involves stopping all cracks with putty or mud, boarding up the windows from the outside and covering the inner window surface with wet blankets; also in laying in stores of provisions, water and other essentials. In well-to-do homes this might be possible but is certainly impractical for the homes of the poor.

For civilian protection against poison gas a cheaper but efficient mask is also needed, Mr. Marshall contends, in place of the military masks now developed. Little progress has been made in this direction.

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AERONAUTICS

Valve on Parachute Allows Descent to Be Controlled

TESTS of an improved parachute which can be controlled in its descent have been reported from Moscow.

A special valve allows the parachutist to open his 'chute only partly at first and then gradually slow up his fall by allowing the parachute to fill with air.

The new development is said to allow a parachute jumper more latitude in selecting the spot where he wishes to land and greatly to reduce the jerk inevitably occurring in the delayed jump with the ordinary parachute.

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A large deposit of molybdenum ore is to be exploited in Turkey.

Nevada has built a museum—the Lost City Museum, near prehistoric Indian ruins.

GENERAL SCIENCE

Science Today and Tomorrow

Surveys and Prophesies in Varied Fields Prepared By Five Leading Men for Yale Review's Anniversary

AVIATION in 1950, cosmic rays as tools for studying the ancient history of the universe, the source of stellar energy, long range weather forecasting and invisible filterable viruses.

These are but a few topics in the cross-section of today's and tomorrow's science as presented in the *Postbag*, appearing in the 25th Anniversary issue of *The Yale Review* (Sept. 20). Leading men of science in varied fields contributed to the symposium.

Morgan on Filterable Viruses

Study of the invisible filterable viruses, that act as though they were alive in some ways yet seem to be non-living chemicals in others, offer oncoming young biologists the chance to get closer to that elusive line that separates the living from the dead, Dr. Thomas Hunt Morgan, Nobel Prize winner of the California Institute of Technology, pointed out.

Further "leads" in the same baffling problem are offered by investigations on the vitamins, some of which have recently been produced in chemically pure form for the first time, and by researches on the hormones, or secretions of the ductless glands, particularly the sex hormones and those that promote growth in plants.

Recently opened up lines of investigation on nerve action Dr. Hunt also regards as promising, in particular those that have to do with the gland-like activities of nerve endings in secreting substances that stimulate body-parts to action, and the detection of minute but definitely patterned electrical currents, made possible by the modern development of the vacuum tube.

In the field of genetics where he himself gained fame, Dr. Morgan considers the most important recent developments, which also hold most promise for the future, to be those having to do with the mutations, or sudden changes, in the genes which determine the course of organic heredity, and, of even greater significance, the new methods of accurately mapping the location of the genes on minute but definitely described subdivisions of the chromosomes.

Compton on Cosmic Rays

Reviewing the unanimity of experimental evidence that cosmic rays come to the earth from the depths of outer space, are affected by the earth's magnetic field and are mostly electrical in nature, Dr. Arthur H. Compton, professor of physics, University of Chicago, states:

"A fascinating point is that the rays appear to come from such great distance and such remote time as to suggest the possibility through their study of learning something regarding the ancient history of our universe."

While the science of physics has learned much about the outer cloak of the atoms, the Nobel Prize winning scientist adds, the inside nuclei offer a much more difficult field of research.

"The inner nucleus, about which this electrical atmosphere spreads, has remained an unconquered citadel. Rapidly, however, breaches in the walls of this castle are being made, and spies in the form of high-speed particles are bringing us information regarding the inner fortress. Important knowledge has been gained from the studies of radioactivity which were started early in the present century. Artificial disintegration of the atom's nucleus, first accomplished by Rutherford during the period of the Great War, has within the past half decade become an important tool of investigation. One of the most striking recent developments has been that of Fermi in building up heavier atoms out of lighter ones, which has led to the discovery of a whole new series of artificial radioactive elements."

Russell on Galactic Size

Latest determinations of the size of the galaxy of which the earth and sun are a part indicate, Prof. Henry Norris Russell, Princeton University astronomer, reports, the diameter is so great that a ray of light, traveling at 186,000 miles a second, takes about a hundred thousand years to cross it.

The whole galaxy, he adds, is rotating about a center which is some 30,000 light years from the sun. One revolution of the galaxy is completed in roughly 200,000,000 years.

The mechanism which makes possible the pouring of radiant energy into space, which the stars have been doing for millions of years, is still a mystery. Prof. Russell states. The enormous liberation of energy is too great to arise from any known source except atomic transformation.

"Now that such transformations—sometimes liberating enormous energy—have been produced in the laboratory," Prof. Russell declares, "there is hope that real advances in our understanding may come within a few years."

Abbot on Long-Range Weather Forecasts

Students of weather and climate will await with interest the publication of long-range forecasts made for 1935 and 1936 by Dr. Charles Greely Abbot, secretary of the Smithsonian Institution, based on his now famous 23-year climatic cycle. A forecast for 1934, which Dr. Abbot published recently, agrees to a high per cent. of accuracy with the actual weather for that year. The forecasts for the current year and 1936 he is withholding from publication until he can give them a similar check-up with the actual events, "lest the results for 1934 prove exceptionally favorable and thus misleading."

Warner on Aviation in 1950

Researches aiming for increased efficiency of present-day types of airplanes are rapidly reaching a state of diminishing returns, reports Edward P. Warner, member of the National Advisory Committee for Aeronautics and editor of *Aviation*.

The physical laws underlying airplane flight are setting up positive barriers that are already being closely approached in modern planes.

"Air transport in 1950," Mr. Warner declares, "may move a third faster than in 1935, or it is equally possible that the increase in speed will be negligible, but its costs of operation ought to be down by a third or more." (*Turn to Page* 221)

MEDICINE

Anti-Tularemia Serum and Vaccine to Get Trial

A SERUM and vaccine, devised by Dr. Lee Foshay, department of bacteriology, University of Cincinnati Medical College, as preparedness against tularemia, or rabbit disease, has been supplied the Public Health Center in Cincinnati, Ohio, for inoculation of hunters in preparation for the approaching opening of the hunting season.

The vaccine is to immunize against the disease, and the serum is for treatment of infected persons.

These preparations were supplied the Cincinnati Health Center last year by Dr. Foshay and were found to have provided a high degree of protection against the disease to approximately 100 persons who were inoculated with them.

Dr. Foshay has been experimenting with the tularemia serum and vaccine for the past five years. Further experiments, however, will be necessary, Dr. Foshay states, before the preparations may be accepted as "standard."

Dr. Frank K. Harder, acting city health commissioner, has issued a warning to hunters to avoid dead rabbits lying in fields, and sick rabbits too easily shot. He advised that gloves be worn in handling rabbits.

Science News Letter, October 5, 1935

PHYSIOLOGY

Find Loud Noise Causes Deafness By Nerve Damage

CONTINUOUS exposure to constant noise of sufficient loudness will cause deafness due to nerve damage, Dr. M. H. Lurie of Harvard University told members of the American Academy of Ophthalmology and Otolaryngology.

By listening in with a special kind of radio hook-up on the hearing apparatus of cats' ears, Dr. Lurie and associates were able to learn much about the causes of different kinds of deafness. Some of their conclusions are:

1. Deafness of adult life can be caused by the neglect of mild ear trouble of childhood.

2. Exposure of people to loud noises for long periods of time will cause a dying of the sensitive hearing cells in the ear, followed by deafness.

3. Certain diseases and drugs, typhoid fever, mumps, influenza, quinine and alcohol, cause actual destruction of the nerve endings of the inner ear.

4. Explosions can dislocate these special hearing cells, throwing them off the vibrating membrane on which they rest.

5. Unregulated noise over long periods may seriously injure the nerves by which we hear.

In the course of the experiments the investigators found in the animals tested all the different types of deafness that human beings have. These included the inherited type of deafness; deafness caused by disease of the drum and bones of the ear that bring the sound to the inner ear; the chronic deafness caused by repeated colds; deafness in which the nerve of hearing itself is involved; and loss of hearing as a result of the animal hearing loud noises for a long period of time.

Besides studying these various kinds of deafness with the super-radio apparatus, the investigators examined the animals' ears microscopically in order to find, if possible, the exact causes of the conditions.

Science News Letter, October 5, 1935

MEDICINE

Finds That Liver Extract Relieves X-Ray Sickness

X-RAY sickness, which has been a distressing accompaniment and sequel to X-ray treatment in many cases ever since the rays were first used in treatment, may be relieved by liver extract, Dr. Barton R. Young of Temple University Medical School reported at the meeting of the American Roentgen Ray Society.

The liver extract may be injected into either muscles or veins.

Dr. Young gave the extract to a series of thirty patients who suffered from nausea and vomiting following X-ray treatments. Over half of the patients were completely relieved by the liver extract and about one-fourth more were partially relieved. The remainder were not helped.

Just why the liver gives relief to these patients Dr. Young said could not be explained at the present time. It is not a specific cure for X-ray sickness because it does not help all patients. There is no way of telling in advance which patients will be relieved. But it produces no harmful effect, so Dr. Young advises using it on every patient suffering from X-ray intoxication. By using liver extract, it is possible to give larger X-ray doses over larger areas of the body, especially when the X-ray treatment is directed to the abdomen.

Science News Letter, October 5, 1935

IN SCIE

SEISMOLOGY

New Guinea Has Second Earthquake in 4 Days

NEW Guinea's northern coast and the adjacent sea bottom were shaken by the second strong earthquake in four days, on the morning of Monday, Sept. 23, at 4:18.3 a. m., Eastern Standard Time. Time and position of the quake were determined by seismologists of the U. S. Coast and Geodetic Survey, on the basis of information gathered by wire by Science Service.

The epicenter, or spot of greatest earth movement, was only a little off the equator; it was in latitude one degree north, longitude 138 degrees east, somewhat to the northwest of the shock of Friday, Sept. 20.

Seismograph stations reporting to Science Service were those of Georgetown University, Washington, D. C.; St. Louis University, St. Louis, Mo.; the University of California, Berkeley, Calif.; Seismological Observatory, Pasadena, Calif.; and the observatories of the U. S. Coast and Geodetic Survey at Tucson, Ariz., and Chicago.

Science News Letter, October 5, 1935

PSYCHOLOGY

Learn to Draw by Dancing Suggests Psychologist

GYMNASTICS or dancing as preliminary training for drawing is the suggestion made in Germany by Prof. Gunter Schiebe as the result of a study of 2519 drawings made by 478 children aged all the way from 4 to 18 years.

The young artist should feel a joy in movement, Prof. Schiebe says, and before he begins his drawing lessons he should be given training in the larger movements in rhythmic exercises.

The children tested in Prof. Schiebe's experiment were told to draw a tree so as to represent a certain feeling such as happiness, cold, suffering, sadness, and so on. Regardless of the child's ability in drawing, he was able to give some indication of the mood he was trying to portray, it was found. This was done by variations in the size of the tree, its general pattern, and the way the branches were pictured.

Science News Letter, October 5, 1935

IEE FIELDS

PALEONTOLOGY

Great Skull of Mammoth At New York State Museum

See Front Cover

LOOKING squarely at you through the frame of its great curved tusks, the huge skull of a mammoth recently placed on exhibition at the New York State Museum in Albany produces a most awesome effect. The awesomeness is not diminished, either, by the leg-like arrangement of the half-dozen supporting rods needed to hold up its ponderous weight, which somehow produces a vague suggestion of a vast, fantastic insect, striding out of an antediluvian dream.

The skull, known officially as the Randolph Mammoth, was found during excavations at the New York State Hatchery near the town of Randolph. It was in fragments, and cost more than a little difficulty and labor to get together, but the final assembly produced an almost perfect specimen.

The tusks are complete, and are unusually fine specimens. One is exactly 9 feet long, the other 9 feet 4.5 inches.

Science News Letter, October 5, 1935

PSYCHIATRY

Dream Doctors Practiced Long Before Freud's Time

CHEROKEE Indians in North Carolina have dream doctors, who practice a primitive brand of psychoanalysis that was old long before Sigmund Freud was born.

How these Indian doctors treat disease by exploring the patient's dream life has been investigated by Dr. Frans M. Olbrechts, Belgian ethnologist, for the Smithsonian Institution.

Cherokee medicine men used to think of dreams as very powerful experiences that could actually cause an illness, Prof. Olbrechts reports. But nowadays, perhaps through a touch of white man's influence, they lean more to the view that dreams are omens explaining the occurrence of a disease.

Following either theory, the dream doctor hunts for the guilty dream, even if he has to probe the patient's dream life for two or three years back. Once the disease cause is found, the doctor sets to work to make it let go its hold. The patient takes the herb or other treatment prescribed, confident that the evil is being chased out.

Among dreams that Cherokee doctors find significant, are listed these:

Burning a foot, hand, or finger in a dream will be followed by snakebite.

Dreaming that your ball team wins a game means some one in the village will soon die.

Dreaming of a train journey with a companion means the companion will die within the year.

A nightmare of the long-haired little people of the hills, evil fairies, is a forerunner of insanity.

Dreams about fish, a crowd of visitors, losing some personal belonging, or a variety of other things are signs of general sickness that the dream doctor finds significant.

In studying Cherokee medicine—of which dreams are one colorful feature—Dr. Olbrechts was guided by an old Indian manuscript which has belonged to the Smithsonian for some time, and which was partly edited by James Mooney of the Smithsonian staff before his death.

Science News Letter, October 5, 1935

ARCHAEOLOGY

Horses Found Buried With Medieval Women of Asia

GRAVES of Bronze Age men—and also women—buried with one, two or even three faithful steeds beside them have been discovered in the Altai Mountains.

An expedition from the Moscow State Museum of History, exploring seventh to ninth century graves in these mountains of southern Siberia, uncovered the burials in which horses were so conspicuous.

The skeleton of one warrior was found accompanied by three horses in full harness, a servant, weapons, ornaments of gold and silver, and other possessions. The archaeologists listed 224 antique articles from this extraordinary burial alone. One silver jug bears writing in Orkhon script, an ancient Turkish script of the seventh and eighth centuries.

Stone cases formed coffins for the bones interred in one of the mounds.

Millstones from a hand mill found in one mound, together with evidence of an irrigation system, are reported as evidence that agriculture was extensively developed in the Kuray Steppes of this mountain region.

Science News Letter, October 5, 1935

DENTISTRY

Better Dental Diagnosis With Mercury Lamp

THE HIGH intensity mercury vapor lamp is being tried out in New York City as an aid to better dental diagnosis. Instead of examining the mouth in daylight or by the light from ordinary electric lamps, Dr. M. M. Scheman of Brooklyn is using the ghostly blue-green rays from the mercury lights in his practice.

Many people are familiar with the almost sickly greenish-yellow color to which a person's face turns under the mercury light. Dr. Scheman finds that the teeth appear whiter and the mucous membrane of the mouth looks dark purple in the same rays. Mouth diagnosis is aided by bringing about a sharper contrast between healthy and unhealthy tissues, he finds.

Besides the apparent greater whiteness of healthy teeth, it has been found that there is a slight characteristic fluorescence. Tartar and film deposits on the teeth do not fluoresce in this fashion, and, as a result, stand out sharply in contrast to increased whiteness of the healthy enamel.

Since the mucous membrane tissues turn to their deep purple color, there is considerable contrast between them and the mouth disturbances which retain their normal appearance. Ramifications of the blood vessels, it is found, are more clearly defined than under normal illumination. Pathological disturbances in the mouth such as abscesses, conditions of inflammation in and about the necks of teeth and the mucous membranes are sharply accentuated by marked changes of color.

Science News Letter, October 5, 1935

AGRICULTURE

Hebrew University Starts Agricultural College

HEBREW University, Jerusalem, is constructing laboratory buildings for a new college of agriculture. It is expected that the institution will be ready for students in the fall of 1937.

Agriculture has always been the major occupation for the Arabian and Jewish population of Palestine, and it is expected it always will be. Conditions of land and climate are so different from those found in other parts of the world, however, that extensive research will be necessary for the reorganization of life on the land along modern scientific lines.

Science News Letter, October 5, 1935

ETHNOLOGY

Thoughts Can Kill

Extraordinary Duels Fought by California Indians, in Which Only Weapon is Hypnotic Power, Described by Chief

By EMILY C. DAVIS

THE MOST extraordinary duels in the world are fought in California. Not in the movies, either, though one of these contests would make a tensely dramatic scene.

The strangest of all personal battles are fought by clashing minds. Not a pistol is fixed. No sword flashes through the air. The fighters merely face one another and hurl their thoughts and power until the weaker fighter falls down helpless—paralyzed, maybe, or even dead. Yes, stone dead.

You don't believe thoughts can kill? Testimony that thoughts have this deadly power has come to Washington from two sources recently.

Chief Wi'ishi, athletic young Indian of the Mission tribe in California, visiting Washington this summer, told of his own experiences in such combats. With smiles and gestures, he showed how the power is hurled from heart to heart, straight as the blow of a fist from a Joe Louis or a James Braddock.

And listening to Chief Wi'ishi, Dr. John P. Harrington of the Bureau of American Ethnology nodded his assurance that these psychic battles do take place, sometimes with crippling or fatal results. White men are not generally welcome at these little known events. But Dr. Harrington has spent many years among the Mission Indians, studying vanishing customs of the aboriginal New World. He has attended some of the secret contests, and has heard stories of other duels which have become Indian history.

Surpass Orientals

From what he has seen and heard, Dr. Harrington has come to a surprising conclusion about the American Indian's psychic powers. That is, it seems surprising in view of the fame of Hindus in this field. He says plainly that American Indians surpassed Oriental mystics of India in psychic exploits.

As for white men in America, Dr. Harrington dismisses the lot with a casual: "We are mere infants compared to the Indian in use of mental powers."

The American Indians set great store by psychic development, regarding material show as not nearly so important, he explains. All Indians tried to develop their minds in such matters as concentration and meditation. They tried to learn healing and killing art through dreams, and to draw on reserves of power that they felt within them.

American Indians could—and a few still can—perform stunts equal to the famous Hindu rope trick and other illusions of the fakirs in India. The American Indians mastered the secrets of hypnotism. They claimed power to kill an enemy a hundred miles away. More startling than that, they claimed power to restore life to an apparently lifeless form. That is to say, Indian adepts at psychic power, the medicine men, attained these marvels.

Super-Attraction

All this being the case, you can see why a battle of power between two master minds would be a super-attraction in the Indian world. For the Indian crowd, it had all the excitement of Spain's bull-fighting contests—well-known men in a supreme struggle before their eyes, with death perhaps for a sudden ending.

For the fighters, the contest was a solemn and necessary business. They had to go through with it. They were medicine men, depending heavily on psychic powers in their healing. Well, then, they were expected to show off on these occasions, let the public see that they could indeed work wonders. If a medicine man won a knock-out victory, he could count on plenty of patients. If he lost! Down went his prestige. He might be left paralyzed, helpless. But he had to take that risk.

Modern doctors may well be glad they are not expected to show their skill in any such public contests.

The psychic battles take place, Dr. Harrington explains, at inter-village fiestas which Mission Indians hold at intervals. More than anything else, the villages look forward to these fiestas. Village chiefs arrange for the affairs in advance and pay for them by an elaborate system of banking, using shell wampum for money. Messengers of the chief giving the fiesta go out to invite the people of villages all around. And on the appointed day, each group arrives at the village in ceremonial entry, hearing welcoming speeches and returning them.

PSYCHIC WEAPON

Chief Wi'ishi shows how he takes the power from his heart—by way of his throat.

"Among the invited villagers of a group," says Dr. Harrington, "there is sure to be a medicine man, one revered for his powers over the unseen universe. He walks over to men of his own class and power, who may be standing among the receiving group, and in a very few words he invites them to a test of power.

"They draw a line on the ground, like the goal line for a tug-of-war, while the challenger goes down to the creek and prepares for the contest by painting his face or putting on ceremonial costume, even if only adding a feather to his hair or fixing his necklace.

"When he emerges, he is no longer the man that retired from their sight. He is changed, like a rampaging bull. He marches on, with clutching hands, extracting from his heart and extracting from the air an invisible power. Beyond

the line stand the waiting medicine men —sometimes not merely one, but four or five opponents lined against him. They stand tense, not knowing what fate is in store for them. Every one knows that men have fallen down dead in these contests.

Clutching Power

"Still the challenger comes on, snatching, forming, and holding the invisible power of the universe in his two hands, and ready to throw it when least expected.

"Suddenly, he throws it! One of the receiving medicine men falls, foams at the mouth, kicks, and lies still. The crowds stirs, wondering if he is stunned, or dead.

"But the injured medicine man staggers to his feet again. He gathers power, and with gestures of catching and holding it, he suddenly shoots it back at the intruder. All the medicine men hurl their power at the challenger. Still, the intruder does not fall. He pushes forward daringly and crosses the line in triumph."

After the contest, which in this case does not include a funeral, the winning medicine man is the hero of the fiesta. He has withstood the power of four of the most powerful medicine men of the countryside.

"Indians with knowing smiles and secret conversation about the fiesta ground congratulate the winner on having crossed the line," says Dr. Harrington concluding his account. "The man's reputation is made for months to come. He will have no trouble in getting cases of sickness of the kind he knows best how to cure, and he is sure of liberal payments. He is a great doctor."

But, what actually happens when mind struggles with mind "to the death"?

Chief Wi'ishi, who talks halting English in his soft, very low voice, explains it one way. Dr. Harrington another.

Says the young chief: "My father, he medicine man. My grandpa, my great grandpa, he medicine man. Only medicine man's son has this power. It given to me by my father. Power thrown from here — inside — so. Power strike down, kill."

SUSPENSE

He holds the power tight in his hands, awaiting the psychological moment for hurling at his foe.

Fear Kills

Dr. Harrington's explanation is that if an Indian dies in these combats, he really kills himself. It is the fear, the excitement of the contest, and perhaps the sickening feeling inside that he is indeed not so strong as his rampaging opponent. All this turmoil of apprehension and fear proves too much for a weak heart or an otherwise failing human engine. By sheer auto-suggestion, the weaker man dies or falls paralyzed—because he expects that fate to overtake him. The psychic blow of the conqueror has killed him, in one sense.

Chief Wi'ishi, politely smiling, is not quite sure that all this talk of auto-suggestion is as good as his own simple explanation. But, whatever the inner facts may be, as Dr. Harrington points out, the fundamental fact remains: thoughts and fears act as weapons in these fights, dealing knock-out blows.

In these Indians, the subconscious mind, Dr. Harrington goes on to explain in Freudian terms, becomes so conditioned to seeing certain activity follow certain stimuli that it is only necessary to furnish the accustomed environment for the Indians to expect a given result. In this case, the downfall or "permanent damage" to the weaker fighter is a foregone conclusion. Therefore, it happens.

Text books on psychology, Dr. Harrington says, have overlooked the striking phenomena which many Indian situations, such as the psychic contests, reveal.

"Nowhere," he declares, "do we find such astounding facts concerning psychic development as in the extreme southwest of the United States—that is, in southern California."

Like the Hindu, who can make a tree grow before the astonished eyes of a crowd, the Indian medicine man performs similar feats that depend on hypnotism of a whole group. Dr. Harrington has seen them raise a stick from the ground without touching it, make it sink again, or follow them. Tables can be made to engage in the same unnatural behavior.

Hypnotism

"That's hypnotism," says Dr. Harrington, accounting for medicine man's "power" in modern terms. "The Bible miracle of Aaron's rod turning into a serpent before the eyes of Pharaoh is somewhat similar, and may have been achieved by similar means."

The medicine man who is so powerful—by his reputation—that he is known to destroy an enemy for a patron, even at a distance of a hundred miles, gets his results by auto-suggestion. The other fellow actually kills himself. Like the Indian whose own fears and self-suggestion kill or paralyze him in psychic duel, the Indian who knows he is being attacked by a powerful medicine man with magic rites, may actually die of heart failure, or a stroke. Or he may worry himself into a "run-down" physical state in which he is ready to take almost any disease that comes along. If he dies in a reasonable time, the medicine man gets the credit. The medicine man has done nothing to kill—except induce the victim to destroy himself. The Indian, accustomed to regard psychic forces as tremendously real, is a ready prey for such thoughts. So, the medicine man "gets his man" more often than he could in a more resistant and tough minded society.

Not Psychic

As for the medicine man's ability to raise the dead, Dr. Harrington finds, while that is impressive to hear about, it actually is not an example of psychic power, either on the part of the Indian doctor or the patient. It is merely an accident, when it happens.

Primitive people, Dr. Harrington explains, do not use the word dead much in medical matters. They scarcely distinguish between a man who lies in a coma, apparently lifeless, and a man whose heart has entirely stopped. If a doctor revives the man in a coma, every one is astonished, and the Indian doctor gets credit for restoring life.

Unexplained, the Indian medicine man's achievements are mystifying and

awe-inspiring, as unexplained psychic phenomena always are.

Until psychologists and ethnologists came along to explain the unbelievable, by ferreting out the natural laws, the Indians kept their secrets. A medicine man transmitted his power and the techniques for using it only to his son or nephew. With solemn ceremonies, the youth received the power which was "coughed up" by his older relative, held invisible in his hand, and transferred to the boy's heart through the chest wall.

Indian medicine men never tried their famous power to down the white men, when they invaded America. Or, if they did, it failed to work. The Spaniards and other foreigners were, as Dr. Harrington has pointed out, mere infants in psychic development, and the Indian's most potent medicine failed to "take."

Science News Letter, October 5, 1935

ARCHAEOLOGY

Earliest Americans Linked With Old Stone Age Europeans

WERE the earliest known Americans contemporaries of the cave men of the end of the Old Stone Age in Europe and Asia? The remains we have of their arts and crafts indicate that they were, Sir Arthur Smith Woodward of the British Museum, noted student of Stone Age man, intimated at the meeting of the British Association for the Advancement of Science.

Sir Arthur identified the stone implements of the "Yuma" culture of the American Southwest with the "Solutrean" culture of France, carried on by an apparently highly intelligent branch of the Cro-Magnon race. This does not mean, however, that the earliest Americans were also Cro-Magnons; very different races often use similar things—as Indians and Fiji Islanders of today drive Fords. But the use of similar things by different peoples in widely separated parts of the world is at least an indication of their possession of a common culture, and suggests that they lived at about the same time. On this basis, Sir Arthur provisionally assigned the end of the Ice Age as the possible date of the first human immigration into the North American continent.

Once man got here, he was not content to use only his own versions of Solutrean tools which he had brought with him, but branched out into inventions of his own. The speaker told of types of spearheads used by these earliest comers from the "Old Country," which were fitted to the shaft after a fashion never used by Stone Age man in Europe. It is perhaps the first known instance of "Yankee inventiveness."

These first Americans came into a land that must have been as strange to them as the later America, with its bison, grizzly bears, pronghorn antelope and other animals never before seen by white men, must have looked to the first settlers from Europe. Associated with implements of human manufacture in the Southwest are bones of extinct species of bison and musk ox, the latter found only as a vanishing genus in today's Arctic regions. Even stranger were the lumbering long-haired ground-sloths, which have been found not merely as fossils but as dried natural mummies, with parts of flesh and hide and hair still on them. Sir Arthur mentioned having visited these sites during a recent sojourn in the United States.

All these things make the "dating" of the earliest American very difficult. These animals were all dead in Europe by the end of the Ice Age. The most plausible inference at present seems to be that they survived, at least in small numbers, considerably later on this continent, to serve for food to the earliest American immigrants—and no doubt to give him moments of bewildered wonderment as well.

Science News Letter, October 5, 1935

FALL BOOK NUMBER

- The Fall Book Number, to be issued October 26, will list practically all of the important new books on science.
- Readers of the NEWS LETTER, who have written scientific books published since July 1 or to be published before December 31, are invited to send in the titles for inclusion in the list. Please give title, author, publisher and price. Mail before October 10 to:

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BOTANY

NATURE RAMBLINGS
by Frank Thone

Buffalo-Grass

MANY features of the proposed national reform program for land use are simple returns to the natural state, as things were before our young and over-eager civilization "tore the country wide open" to transplant into it cultivation and exploitation methods that worked all right "in the Old Country." Now we are undertaking to re-grow the forests our grandsires cut down, to reflood the lakes and swamps our fathers drained. It has been realized that wildlife at high productivity may quite readily pay better than farming at low.

In keeping with the rest of this program is the endeavor to re-establish buffalo grass on the now unprofitable plowlands of the Great Plains region. We have found that a cycle of drought will easily wipe out all the agricultural gains made by years of "boom" wheat farming, and that winds often double the ruin and make it permanent by whirling away the soil itself, after drought and the locust have eaten every green thing.

The old native vegetation of the "short-grass" country was dominated by a low-growing, crisply curled, thick-sodded species known as buffalo grass, because of its importance in the diet of the great herds of bison that once covered the

●RADIO

Tuesday, October 8, 4:30 p. m., E.S.T.

WORLD'S OLDEST LANGUAGE—ETHIOPIAN, by Dr. John P. Harrington, Bureau of American Ethnology, Smithsonian Institution.

Tuesday, Oct. 15, 4:30 p. m., E.S.T.

WHEN THE DUCKS FLY SOUTH, by Dr. W. B. Bell, Chief, Division of Wild Life Research, Biological Survey.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

plains. Buffalo grass is highly resistant to drought, will stand all but the most extreme cold, and with its everlasting habit of sending out "runners" like those of a strawberry plant it keeps an uninterrupted year-after-year hold on the soil.

It is as good food for cattle as it once was for the native bison, it can be made into handsome lawns and well-kept golf courses, and in general it offers to be a better vegetable citizen of the West than many of the "fancier" immigrant plants that have been unable to "take it" when the pinch comes. Government and state scientists have carried out experiments with it along a number of lines, and they recommend it highly.

It does, however, need encouragement to re-establish itself where it has been plowed out. It was thought at first that if an abandoned field were just left alone the buffalo grass would reclaim it. But experience has shown that this will not take place fully in less than 20 or 30 years, and in the meantime less desirable grass species and weeds will be in possession.

Fortunately, its growth habits make it fairly easy to propagate. It will grow from seed, it will take hold as solid sheets of transplanted sod, and chopped-up sod bits send out their runners to extend and solidify their little conquests in quite rapid fashion. A recent circular of the U. S. Department of Agriculture gives practical suggestions for those who would aid nature in re-establishing the West's ancient mantle of buffalo grass.

Science News Letter, October 5, 1935

SEISMOLOGY

Quake Shakes Sea Bottom Off British Columbia

AN EARTHQUAKE of moderate severity shook the sea bottom off the coast of British Columbia on Tuesday afternoon, Sept. 24, at 5:12.2 p. m., Eastern Standard Time. The location of the quake's epicenter, in latitude 50 degrees north, longitude 131 degrees west, was worked out by seismologists of the U. S. Coast and Geodetic Survey from data transmitted by wire through Science Service.

Stations reporting were those of the Dominion Observatory, Ottawa; the Dominion Meteorological Observatory, Victoria, B. C.; Pennsylvania State College; Georgetown University, Washington, D. C.; the private observatory of Mrs. M. M. Seeburger, Des Moines, Iowa; the University of California, Berkeley, Calif., and the observatory of the U. S. Coast and Geodetic Survey, Chicago, Ill.

Science News Letter, October 5, 1935

ASTRONOMY—AVIATION

200-Inch Telescope Mirror Now Nears Room Temperature

Announcement That Huge Disk Will Not Be Ready Until December Changes Army Plans for Huge Airplane Wing

THE giant 200-inch diameter glass disk, which eventually will be the great mirror for the observatory of the California Institute of Technology on Mt. Palomar, will be removed from the annealing ovens at the Corning Glass Works within the next month.

The temperature of the huge glass disk is now 302 degrees Fahrenheit, still far above the temperature of boiling water at 212 degrees. The carefully controlled cooling will have so progressed, however, that it is expected that the disk can be removed from the annealing ovens between October 15 and November 1.

Approximately two months later the disk will be placed on its specially built flat car for shipment to California. Tentative date for shipment is between December 15 and January 1.

Announcement that the giant 200-inch glass disk from the Corning Glass Works will not be shipped until the middle of December has altered the plans of the U. S. Army Air Corps to use the specially built flat car to transport east a huge airplane wing now under secret construction at the plant of the Douglas Aircraft Co. at Santa Monica, Calif.

The glass disk, destined for future use as the world's largest telescope mirror, is sixteen feet in diameter. The chord of the huge airplane wing—the distance front to back at the widest point—is approximately the same size.

Aviation officers at Rockwell Field, Calif., had been investigating the possibility of using the special flat car to bring the huge wing back to Middletown, Pa., for assembly.

Because of the delay in shipping the glass disk, the huge wing will probably have to be shipped by water via the Panama Canal, since it will be completed long before December 15.

Details of the new plane are guarded by the Army officials in Washington. Whether the new plane will be a large bombing plane to enter the Army's competition for such planes, or whether a new seaplane is planned, are questions which Army officials will not answer at present.

Because of the experience of the Douglas factory in building commercial land transport planes, conjecture would indicate a bomber. The chord dimension of the new plane of 16 feet would bear out this supposition. The new Douglas transports have a chord of 14.1 feet.

The new clipper ships which the Martin Company recently built for the use of Pan-American Airways in their trans-Pacific flights, by contrast, have a chord dimension of 20.5 feet.

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From Page 215

Since the advent of commercial aviation, almost exactly 25 years ago, the major achievements in a popular sense, reports Mr. Warner, have been (1) the Navy's flight across the Atlantic Ocean in 1919; (2) the Army's round-the-world flight in 1924; (3) Lindbergh's solo flight to France and (4) Wiley Post's flight around the world "in barely more than the scriptural six days of labor."

The supreme developments which have made possible the feats of 1935 airplane transports must include, the aviation authority indicates: (1) the development of the supercharger to improve engine performance at high altitudes; (2) the evolution of an airway system of lighting adequate for night flying of passengers; (3) the improvement of the technique of radio navigation; and (4) the engine cowling, or cookiecutter-looking cover which shields aviation engines and makes possible a reduction of effective air resistance by almost one-third.

Science News Letter, October 5, 1935

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ASTRONOMY

Speed of Meteors Determines The Life of Their Trails

THE SHINING but short-lived train of glory left behind by an unusually bright "shooting star" or meteor has a duration measured by the velocity of the meteor itself. The faster the meteor the longer its train remains visible, at least in the case of the three most important annual shooting-star showers, Dr. Peter M. Millman of the University of Toronto told the American Astronomical Society.

Meteors of the brilliance of Jupiter, at present the evening star, have a train-duration of eight seconds if they belong to the rapid Leonid swarm of November, two seconds in the case of the August Perseids and less than one second if they are in the slower Geminids of December.

Meteors that flash into the earth's atmosphere "on their own," not belonging to any of the regular showers, have train-duration periods proportional to their individual brightness, Dr. Millman said. His conclusions were based on studies of more than 5,000 observations of bright meteors made at Toronto and at Harvard College Observatory during the past four years.

Dr. Millman has also studied the altitudes of meteor trains, searching records gathered at many observatories during nearly a century. From 540 descriptions of very bright meteors he found that about half reported bright trains of luminescent dust which remained visible for periods ranging from one minute to several hours after the meteor itself had faded out. Heights of many trains ranged from six to eighty miles.

Average heights at which trains were seen varied with sun's position. They were greater as the sun descended lower beneath horizon, a fact previously unknown to astronomers.

Science News Letter, October 5, 1935

Famous Naturalists in Search of Vampire Bats and the Bushmaster

SNAKE HUNTERS' HOLIDAY

By RAYMOND L. DITMARS and WILLIAM BRIDGES

The brief newspaper reports covering the efforts to obtain a bushmaster, one of the deadliest of reptiles, for the New York Zoo, aroused interest everywhere. Here is the complete, exciting story of the recent tropical field expedition in Trinidad and British Guiana headed by Dr. Ditmars, curator of the New York Zoological Park, which resulted in securing the bushmaster and other deadly reptiles, many bats and other rarities. Illustrated. $3.50

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ARCHAEOLOGY

Greek Flood Control Ideas Found in Corinth Digging

DISCOVERY of flood control ideas in ancient Corinth is reported by Prof. Richard Stillwell, who has just returned to Princeton after four years in Greece.

The system, whereby city fathers of Corinth tried to protect the streets and people against flood rains from nearby heights, is the latest discovery of the American School of Classical Studies at Athens. Excavations in the Corinthian market place revealed the system.

The Corinthian device was a large catch-basin to catch rain water from the slopes of Acrocorinth, nearby citadel which towered almost two thousand feet. An entering flume and a conduit led the water from the basin. The course of this conduit is not yet traced, but it is believed to have emptied into the large drain that carried overflow water from the famous fountain of Peirene, where, according to legend, the winged horse Pegasus drank and was caught and bridled by Bellerophon.

By far the most important object of art unearthed during the 1934-35 season, according to Prof. Stillwell, is the right forearm of an ivory and gold statue of the third century B.C., which is outstanding because almost unique.

"Many such works of art have been listed in antiquity," declared Prof. Stillwell, "but all have disappeared except for a few isolated fragments."

The ivory of this piece is well preserved and it has sockets at each end for attaching an upper arm and hand. It is apparently the arm of a woman.

Further information concerning the ground plan of the ancient city was provided by unearthing another of the principal entrances to the market place. Other important finds of the expedition, which worked for six weeks last fall and ten weeks during the spring, included four small temples and numerous buildings.

Science News Letter, October 5, 1935

ANTHROPOLOGY

"Highbrows" Do Not Have High Brows

"HIGHBROWS" do not have high brows. Negroes and Eskimos have higher foreheads than the proud Caucasian.

These and other data, upsetting to anyone who bases his claim to superiority on the height of his forehead, are offered by Dr. Ales Hrdlicka, anthropologist of the U. S. National Museum, in the new annual report of the Smithsonian Institution.

Measurements on many hundreds of skulls in the museum collections, as well as on the heads of living men and women, show that the average forehead height of "Old Americans" of the white race is 2 5/8 inches. American Indians have foreheads hardly a thumbnail-thickness higher. But American Negroes have foreheads averaging 2 3/4 inches high, and Eskimos 2 7/8 inches.

Averages among various white races show Armenians to be the lowest-browed, with 2 3/8 inch foreheads. Irishmen have the highest foreheads, 2 5/8 inches. Hungarians and Frenchmen rank next to Armenians as "lowbrows"; Old Americans and Germans next to the Irish as "highbrows."

But lest any one take undue credit to himself for racial superiority in forehead height, Dr. Hrdlicka makes it clear that this measurement has nothing to do with intellectuality. He measured four groups: Old Americans at large, representing the "average citizen" of native stock; Tennessee highlanders, a group much retarded educationally; Old American members of the National Academy of Sciences, and Academy members without regard to race. The latter two groups, of course, may be presumed to be the very cream of American intellectual life.

Their foreheads were all of almost exactly the same average height. There wasn't a twelfth of an inch difference in the forehead heights of the four groups. And the averages for the Old Americans in the Academy and the Old Americans from the Tennessee mountains were precisely the same!

Science News Letter, October 5, 1935

*First Glances at New Books

Additional Reviews On Page 224

Agriculture—Commerce

ALL ABOUT TEA—William H. Ukers—*Tea and Coffee Trade Jour. Co.*, 2 volumes, 1152 p., $25 per set. Tea, from the earliest mists of Chinese tradition down to the roaring markets of London and New York, forms the subject of this exhaustive work. Origin of its use, history of the tea trade, its part in the outbreak of the American Revolution, the rise and passing of the clipper ships, evolution of tea cultivation, harvesting, handling and marketing, brief biographical sketches of notable figures in the world's tea trade—every imaginable point of information a tea-curious person might wish to ask for. The book's title is correct: it tells *all* about tea.

Science News Letter, October 5, 1935

Chemistry

FOOD AND BEVERAGE ANALYSIS—Milton A. Bridges—*Lea & Febiger*, 246 p., $3.50. This new and comprehensive reference work on nutritive and caloric values in food takes into account the importance of canned and packaged foods, including many products by brand names. Besides the main feature of the book—the alphabetic listing of foods and their analyses—there are sections on strained foods, special dietetic foods, and alcoholic beverages, and chapters on vitamins and other food factors.

Science News Letter, October 5, 1935

Demography

IS INDUSTRY DECENTRALIZING?—Daniel B. Creamer—*Univ. of Pennsylvania Press*, 105 p., $1. A report of the Study of Population Redistribution showing movement toward middle-sized cities. (See SNL, Aug. 24, p. 122).

Science News Letter, October 5, 1935

Natural History

WILD LIFE IN THE SOUTHWEST—Oren Arnold—*Banks Upshaw & Co.*, 274 p., $1.75. A breezily written and entertaining book to take along on tour. The illustrations, though, leave something to be desired.

Science News Letter, October 5, 1935

Mathematics

NEW NUMBERS — F. Emerson Andrews—*Harcourt, Brace*, 168 p., $2. Probably almost everybody has at one time or another speculated on the possibilities involved in the substitution of a duodecimal for the present decimal system of counting and calculating. Mr. Andrews here actually carries a duodecimal arithmetic through as far as common logarithms. It is a bit odd that in his brief historic sketch he does not mention the ancient Mesopotamian sexagesimal system, which combined some elements of both decimal and duodecimal systems.

Science News Letter, October 5, 1935

Geology

REPORT OF THE COMMITTEE ON SEDIMENTATION, 1932-1934 — *Division of Geology and Geography, National Research Council*, 246 p., $1. Bulletin No. 98 of the National Research Council. A continuation of the Research Council's useful and important work on this basic geologic process. The present volume includes contributions by Antevs, Becker, Blackwelder, Twenhofel, Vaughan and others.

Science News Letter, October 5, 1935

Plant Physiology

THE TRANSLOCATION OF SOLUTES IN PLANTS—Otis F. Curtis—*McGraw-Hill*, 273 p., $3. A book necessary to all plant physiologists, getting into compact compass all known facts, as well as the principal hypotheses, regarding one of the most important, and at the same time most difficult to investigate, of all classes of plant activities. There is a good bibliography.

Science News Letter, October 5, 1935

Physiology

EXPERIMENTAL PHYSIOLOGY—Maurice B. Visscher and Paul W. Smith—*Lea & Febiger*, 191 p., $3.25. An illustrated manual of experiments for classroom use. Some of the experiments are intended for demonstration by the instructor and others for performance by the students.

Science News Letter, October 5, 1935

Geology

AUTOBIOGRAPHY OF EARTH—John H. Bradley—*Coward-McCann*, 347 p., $3. A well-ordered popular account of historic geology, written by a man with a genuine gift for vivid description and telling phrase, which extends even to such things as chapter headings. A sustained sense of drama dominates the book, heightened by the somewhat impressionistic page illustrations by K. M. Adams.

Science News Letter, October 5, 1935

Zoology

PARADE OF THE ANIMAL KINGDOM—Robert Hegner—*Macmillan*, 675 p., 743 illus., $5. A big $5 worth of book about animals by a veteran zoologist who can make natural history accurate without making it dull. The half-tone illustrations, many of them full-page in size, have been very carefully selected; some have appeared from time to time in the SCIENCE NEWS LETTER.

Science News Letter, October 5, 1935

Agriculture

GRINDSTONE FARM—Henry B. Lent—*Macmillan*, 127 p., $1.75. Life and work on a typical American grain-plus-dairy farm described and pictured for younger readers. The illustrations, by W. S. Bronson, have originality and zest.

Science News Letter, October 5, 1935

Entomology

THE EMPEROR OF THE ANTS—Luigi Bertelli (Vamba); translated by Nicola di Pietro—*Crowell*, 240 p., 120 illus., $1.50. Insects, "anthropopsychized" out of all recognition, in a hopless *mélange* of proper-enough insect behavior and completely higher-anthropoid motive and rationalization. This book is not recommended.

Science News Letter, October 5, 1935

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Additional Reviews On Page 223

Oceanography

THE SEA FOR SAM—W. Maxwell Reed and Wilfrid S. Bronson—*Harcourt, Brace,* 360 p., $3. Sam, the insatiable-minded junior, is now exceedingly well endowed. His uncle, Mr. Reed, first presented him with the Earth, then with the Stars; now, in company with the versatile Mr. Bronson, who wrote part of the chapters and did all the illustrations, he offers him the Sea. But Sam may have to hide his book, or at least put up a loud "holler" for its possession; else he'll find his elders gobbling it up first.

Science News Letter, October 5, 1935

General Science

THE ADVANCEMENT OF SCIENCE 1935—*British Association for the Advancement of Science,* 222 p., 3s, 6d. Presidential addresses presented at the recent Norwich meeting of the BAAS. (See SNL, Sept. 14, 21, etc.)

Science News Letter, October 5, 1935

General Science

USEFUL SCIENCE FOR HIGH SCHOOL —H. T. Weed, F. A. Rexford and F. B. Carroll—*Winston,* 707 p., $1.68. Chemistry is here made real by illustrations from water and fire, physics by reference to automobiles, electric bells and cameras, biology through sprouting seeds and the processes of digestion and breathing. Contact of science with everyday life is established at a thousand points.

Science News Letter, October 5, 1935

Biology

AN INTRODUCTION TO BIOLOGY—Edward L. Rice—*Ginn,* 602 p., $3.20. A departure from the customary effort to pack a general survey of all living nature into an elementary textbook; it strives instead to give completer understanding of typical structures and basis processes: "a sampling of biology."

Science News Letter, October 5, 1935

Dietetics

DIET AND PHYSICAL EFFICIENCY—Howard W. Haggard and Leon A. Greenberg—*Yale,* 176 p., $3. The authors maintain that the day's diet should be rearranged on a five-meal schedule. So-called industrial fatigue is really hunger and the five-meal plan is suggested as the remedy. The book is largely given over to describing the physiological experiments on which the authors base their conclusions, and consequently most of the volume is too technical for lay reading. Because of the relation to industrial efficiency, however, non-medical persons engaged in industrial management, as well as physicians, nutritionists and other medical scientists, may find the book of considerable interest.

Science News Letter, October 5, 1935

Psychiatry

DESTINY AND DISEASE IN MENTAL DISORDERS—C. Macfie Campbell—*Norton,* 207 p., $2. One of the Thomas W. Salmon Memorial Lectures series sponsored by the New York Academy of Medicine. The book is not suitable for general lay reading but social workers and psychologists as well as psychiatrists will be interested in Dr. Campbell's thoughtful discussion of mental diseases. Special emphasis is placed on schizophrenia.

Science News Letter, October 5, 1935

History of Medicine

THE STORY OF MEDICINE IN THE MIDDLE AGES — David Riesman — *Hoeber,* 402 p., $5. This book undertakes to fill the gap in general knowledge of medical history between the Greek period and the beginning of the modern period. The lay as well as the medical reader will find much of interest in this account of a neglected period.

Science News Letter, October 5, 1935

Neurology

THE ANATOMY OF THE NERVOUS SYSTEM (Fifth Ed.)—Stephen W. Ranson—*Saunders,* 501 p., $6.50. Addition of many illustrations and revision to include important new concepts without increasing materially the size of the book feature the fifth edition of this text for medical students.

Science News Letter, October 5, 1935

Archaeology

STAMPED AND INSCRIBED OBJECTS FROM SELEUCIA ON THE TIGRIS—Robert H. McDowell—*University of Michigan Press,* 280 p., $3.50. Deals mainly with evidence regarding official seals and stamps used in the period of Seleucid control of Babylonia. The residence of a wealthy family is the chief source of the seal and stamp impressions described.

Science News Letter, October 5, 1935

Astronomy

THE SOLAR SYSTEM AND ITS ORIGIN—Henry N. Russell—*Macmillan,* 144 p., $2. A leading astronomer, who also has the gift of clear and understandable popular interpretation, here puts the solar system into the test-tube of spectroscopy for analysis. Into a severer test-tube go the hypotheses that would account for cosmic syntheses—and most of them roll out again with the Scotch verdict "not proven" upon them. An informative book for those who have not "kept read up" on the newer things in astronomy; an excellent opportunity to sum up, for those who have.

Science News Letter, October 5, 1935

Geology

MAMMOTH CAVE IN THIRD DIMENSION—*Orthovis Co.,* 31 p., $1.50, plus postage. A picture book of one of the greatest of America's natural wonders, in the now familiar two-color stereo-effect offset, with viewing screens.

Science News Letter, October 5, 1935

Picture Books

THE GLASS BOOK—William C. Pryor and Helen S. Pryor—*Harcourt, Brace,* 101 p., $1. THE STEEL BOOK—William C. Pryor and Helen S. Pryor—*Harcourt, Brace,* 101 p., $1. Attractive books for children (and adults) telling in photographs and a minimum of text the story of two great industries.

Science News Letter, October 5, 1935

Photography

MODERN PHOTOGRAPHY — Edited by C. G. Holme—*Studio Publications,* 128 p., $3.50 cloth, $2.50 wrappers. The cream of another year's crop of photographs. Group studies of various kinds, and "angle shots," are played up somewhat more prominently than heretofore in this series. "Dancer," by Kichinosuke Benitani, is a most unusual action picture.

Science News Letter, October 5, 1935

Chemistry

TRANSACTIONS OF THE INSTITUTE OF CHEMICAL ENGINEERS, Vol. 12 — 1934 —*Institute of Chemical Engineers, London,* 269, p., 1£ 1s.

Science News Letter, October 5, 1935

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